

# Marine Biology

International Journal on Life in Oceans and Coastal Waters

Volume 79, 1984

---

## Editor in Chief

**O. Kinne** Biologische Anstalt Helgoland, Notkestrasse 31, 2000 Hamburg 52,  
Federal Republic of Germany

## Editors

**M. Anraku**  
Nansei Regional Fisheries Research  
Laboratory, Ono-cho, Saeki-gun  
Hiroshima-ken 739-04, Japan

**B. Battaglia**  
Istituto di Biologia Animale  
dell'Università  
Via Loredan 10, 35100 Padova, Italy

**R. W. Doyle**  
Department of Biology  
Dalhousie University  
Halifax, N.S. B3H 4J1, Canada

**T. M. Fenchel**  
Laboratory of Ecology, Zoological Institute  
University of Aarhus  
8000 Aarhus C, Denmark

**N. D. Holland**  
Marine Biology Research  
Division, A-008  
Scripps Institution of Oceanography  
La Jolla, California 92093, USA

**G. F. Humphrey**  
CSIRO Marine Biochemistry Unit  
Botany Building, University of Sydney  
Sydney, NSW 2006, Australia

## Assistants to the Editors

**R. Friedrich, T. E. Galvin**  
Biologische Anstalt Helgoland, Notkestrasse 31, 2000 Hamburg 52,  
Federal Republic of Germany

**O. Kinne**  
Biologische Anstalt Helgoland  
Notkestrasse 31  
2000 Hamburg 52  
Federal Republic of Germany

**J. M. Lawrence**  
Department of Biology  
University of South Florida  
Tampa, Florida 33620, USA

**J. Mauchline**  
Scottish Marine Biological Association  
Dunstaffnage Marine Research Laboratory  
P.O. Box 3  
Oban PA34 4AD, Argyll, Scotland

**J. M. Pérès**  
Station Marine d'Endoume  
et Centre d'Océanographie  
Rue de la Batterie-des-Lions  
Marseille (7e), France

**J. M. Shick**  
University of Maine at Orono  
Department of Zoology  
Murray Hall  
Orono, Maine 04469, USA

**M. E. Vinogradov**  
P. P. Shirshov Institute of Oceanology  
USSR Academy of Sciences  
23 Krasikova  
Moscow 117218, USSR



Springer International

The final decision on manuscript acceptance rests with the Editor in Chief. The date of final manuscript acceptance and the name of the communicating editor follow each printed contribution.

## Scope of Marine Biology

The Editors invite and will consider for publication original contributions to the following fields of research:

**Plankton Research:** Studies on the biology, physiology, biochemistry and genetics of plankton organisms both under laboratory and field conditions. Biological and biochemical oceanography. Environment-organism and organism-organism interrelationships.

**Experimental Biology:** Research on metabolic rates and routes in microorganisms, plants and animals. Respiration; nutrition; life cycles.

**Biochemistry, Physiology and Behaviour:** Biochemical research on marine organisms; photosynthesis; permeability; osmoregulation; ionregulation; active transport; adaptation; analyses of environmental effects on functions (tolerances, rates and efficiencies of metabolism, growth and reproduction) and structures; migrations; orientation; general behaviour.

**Biosystem Research:** Experimental biosystems and microcosms. Energy budgets; flow routes and balance sheets of energy and matter in the marine environment. Interspecific interrelationships, food webs. Dynamics and structures of microbial, plant

and animal populations. Use, management and protection of living marine resources. Effects of man on marine life, including pollution.

**Evolution:** Investigations on speciation, population genetics, and biological history of the oceans.

**Theoretical Biology Related to the Marine Environment:** Concepts and models of quantification and mathematical formulation; system analysis; information theory.

**Methods:** Apparatus and techniques employed in marine biological research; underwater exploration and experimentation.

## Subscription Information

Volumes 74-78 (3 issues each) will appear in 1983. The price of each volume is DM 282.00 or approx. US \$ 118.00. Prices for back volumes are available on request. Correspondence concerning subscriptions should be addressed to the publisher.

**North America:** Annual subscription rate: Approx. US \$ 618.00 including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to:  
Springer-Verlag New York Inc.  
Service Center Secaucus  
44 Hartz Way  
Secaucus, NJ 07094, USA  
Tel. 201/348-4033,  
Telex 0023 125 994

**All Other Countries:** Annual subscription rate: DM 1410.00 plus carriage charges. Airmail delivery on request only. For Japan, carriage charges (Surface Airmail lifted) are DM 156.00;

for India DM 91.50. Single issue price DM 112.80 plus carriage charges. Orders can either be placed with your bookdealer or sent directly to:  
Springer-Verlag  
Heidelberger Platz 3  
D-1000 Berlin 33  
Tel. 0 30/82 07-1, Telex 01-83 319

**Changes of Address:** Allow six weeks for all changes to become effective. All communications should include both old and new addresses (with Postal Codes) and should be accompanied by a mailing label from a recent issue.

**Microform**  
Microform editions are available from:  
University Microfilms International  
300 N. Zeeb Road  
Ann Arbor, MI 48106, USA

© Springer-Verlag Berlin Heidelberg 1984  
Springer-Verlag GmbH & Co. KG, D-1000 Berlin 33  
Printed in Germany

**Production**  
Springer-Verlag  
Journal Production Department I  
Postfach 105 280  
D-6900 Heidelberg 1  
Federal Republic of Germany  
Tel. 0 6221/487-433, Telex 04-61 723

**Responsible for Presentation of Text**  
Professor Dr. O. Kinne  
Biologische Anstalt Helgoland  
Notkestraße 31  
D-2000 Hamburg 52  
Federal Republic of Germany

**Responsible for Advertisements**  
E. Lückermann  
Kurfürstendamm 237  
D-1000 Berlin 15  
Tel. 0 30/8 82 10 31, Telex 01-85 411

**Printers**  
Graphischer Betrieb Konrad Triltsch  
D-8700 Würzburg

# Contents

## Volume 79 Number 1 1984

M. G. Bensoussan, P.-M. Scoditti, A. J. M. Bianchi Bacterial flora from echinoderm guts and associated sediment in the abyssal Vema Fault	1	R. Williams, D. V. P. Conway Vertical distribution, and seasonal and diurnal migration of <i>Calanus helgolandicus</i> in the Celtic Sea	63
B. Fry <sup>13</sup> C/ <sup>12</sup> C ratios and the trophic importance of algae in Florida <i>Syringodium filiforme</i> seagrass meadows	11	J.-Y. Sire, P. Bonnet Croissance et structure de l'opercule calcifié du gastéropode polynésien <i>Turbo setosus</i> (Proso- branchia: Turbinidae): détermination de l'âge in- dividuel. [Growth and structure of the calcified operculum of the Polynesian gastropod <i>Turbo</i> <i>setosus</i> (Prosobranchia: Turbinidae): determina- tion of individual age]	75
S. R. C. Warr, R. H. Reed, W. D. P. Stewart Physiological responses of <i>Nodularia harveyana</i> to osmotic stress	21	C. Thiriot-Quiévreux Le caryotype d' <i>Aulacomya ater regia</i> (Mollusca: Bivalvia: Mytilidae) des Iles Kerguelen. [The ka- ryotype of <i>Aulacomya ater regia</i> (Mollusca: Bi- valvia: Mytilidae) from the Kerguelen Islands]	89
J. F. Battey, J. S. Patton A reevaluation of the role of glycerol in carbon translocation in zooxanthellae-coelenterate symbiosis	27	P. J. Smith, R. I. C. C. Francis Glucosephosphate isomerase genotype fre- quencies, homozygous excess and size rela- tionships in the sand flounder <i>Rhombosolea</i> <i>plebeia</i>	93
G. Gäde, K.-H. Carlsson Purification and characterisation of octopine de- hydrogenase from the marine nemertean <i>Cere- bratulus lacteus</i> (Anopla: Heteronemerta): com- parison with scallop octopine dehydrogenase	39	P. Pamilo, S. Varvio-Aho Testing genotype frequencies and heterozygosities	99
L. B. Quetin, R. M. Ross Depth distribution of developing <i>Euphausia</i> <i>superba</i> embryos, predicted from sinking rates	47	K. R. Tenore, L. Guidi Carbon-14 net incorporation does not accurately estimate the weight-specific growth rate of the polychaete <i>Capitella capitata</i>	101
O. S. Astthorsson, R. Ralph Growth and moulting of <i>Neomysis integer</i> (Crustacea: Mysidacea)	55		

## Volume 79 Number 2 1984

R. L. Smith, B. R. Hargreaves Oxygen consumption in <i>Neomysis americana</i> (Crustacea: Mysidacea), and the effects of naphthalene exposure	109	T. Payson Wilber, Jr., W. F. Herrnkind Predaceous gastropods regulate new-shell supply to salt marsh hermit crabs	145
R. K. Koehn, J. G. Hall, D. J. Innes, A. J. Zera Genetic differentiation of <i>Mytilus edulis</i> in eastern North America	117	Q. Dortch, H. L. Conway Interactions between nitrate and ammonium up- take: variation with growth rate, nitrogen source and species	151
P. R. Boyle, R. S. Thorpe Optic gland enlargement and female gonad maturation in a population of the octopus <i>Eledone cirrhosa</i> : a multivariate analysis	127	E. J. Buskey Swimming pattern as an indicator of the roles of copepod sensory systems in the recognition of food	165
K. J. Eckelbarger, P. A. Linley, J. P. Grassle Role of ovarian follicle cells in vitellogenesis and oocyte resorption in <i>Capitella</i> sp. I (Polychaeta)	133		

continued on next page

M. Takahashi, T. Hori  
Abundance of picophytoplankton in the sub-  
surface chlorophyll maximum layer in sub-  
tropical and tropical waters 177

C. R. Fries, R. F. Lee  
Pollutant effects on the mixed function oxy-  
genase (MFO) and reproductive systems of the  
marine polychaete *Nereis virens* 187

E. Boysen, F. Buchholz  
*Meganectiphanes norvegica* in the Kattegat.  
Studies on the annual development of a pelagic  
population 195

A. Benović, S. Fonda-Umani, A. Malej,  
M. Specchi  
Net-zooplankton biomass of the Adriatic Sea 209

## Volume 79 Number 3 1984

H. W. van der Veer, C. F. M. Sadée  
Seasonal occurrence of the ctenophore *Pleuro-  
brachia pileus* in the western Dutch Wadden Sea 219

H. Caspers  
Spawning periodicity and habitat of the palolo  
worm *Eunice viridis* (Polychaeta: Eunicidae)  
in the Samoan Islands 229

H.-O. Pörtner, U. Kreutzer, B. Siegmund,  
N. Heisler, M. K. Grieshaber  
Metabolic adaptation of the intertidal worm  
*Sipunculus nudus* to functional and environ-  
mental hypoxia 237

F. D. King  
Vertical distribution of zooplankton glutamate  
dehydrogenase in relation to chlorophyll in the  
vicinity of the Nantucket Shoals 249

U. Båmstedt  
Diel variations in the nutritional physiology of  
*Calanus glacialis* from Lat. 78° N in the summer 257

Y. Endo  
Daytime surface swarming of *Euphausia pacifica*  
(Crustacea: Euphausiacea) in the Sanriku coastal  
waters off northeastern Japan 269

R. J. Thompson  
The reproductive cycle and physiological ecology  
of the mussel *Mytilus edulis* in a subarctic, non-  
estuarine environment

D. Pauly, H. Calumpong  
Growth, reproduction and mortality of the sea  
hare *Dolabella auricularia* (Gastropoda: Aplysi-  
idae) in the Central Visayas, Philippines 289

M. S. Johnson, R. Black  
The Wahlund effect and the geographical scale  
of variation in the intertidal limpet *Siphonaria* sp. 295

K. M. Bailey  
Comparison of laboratory rates of predation  
on five species of marine fish larvae by three  
planktonic invertebrates: effects of larval size  
on vulnerability 303

F. W. H. Beamish  
Swimming performance of three southwest  
Pacific fishes 311

J. E. Graves, S. D. Ferris, A. E. Dizon  
Close genetic similarity of Atlantic and Pacific  
skipjack tuna (*Katsuwonus pelamis*)  
demonstrated with restriction endonuclease  
analysis of mitochondrial DNA 315

L. Cheng, M. Schulz-Baldes, C. S. Harrison  
Cadmium in ocean-skaters, *Halobates sericeus*  
(Insecta), and in their seabird predators 321

M. Fiala, L. Oriol  
Vitamine B<sub>12</sub> et phytoplankton dans l'Océan  
Antarctique. Distribution et approche  
expérimentale. [Vitamin B<sub>12</sub> and phytoplankton  
in the Antarctic Ocean. Distribution and  
experimental approach 325

Indexed in Current Contents

